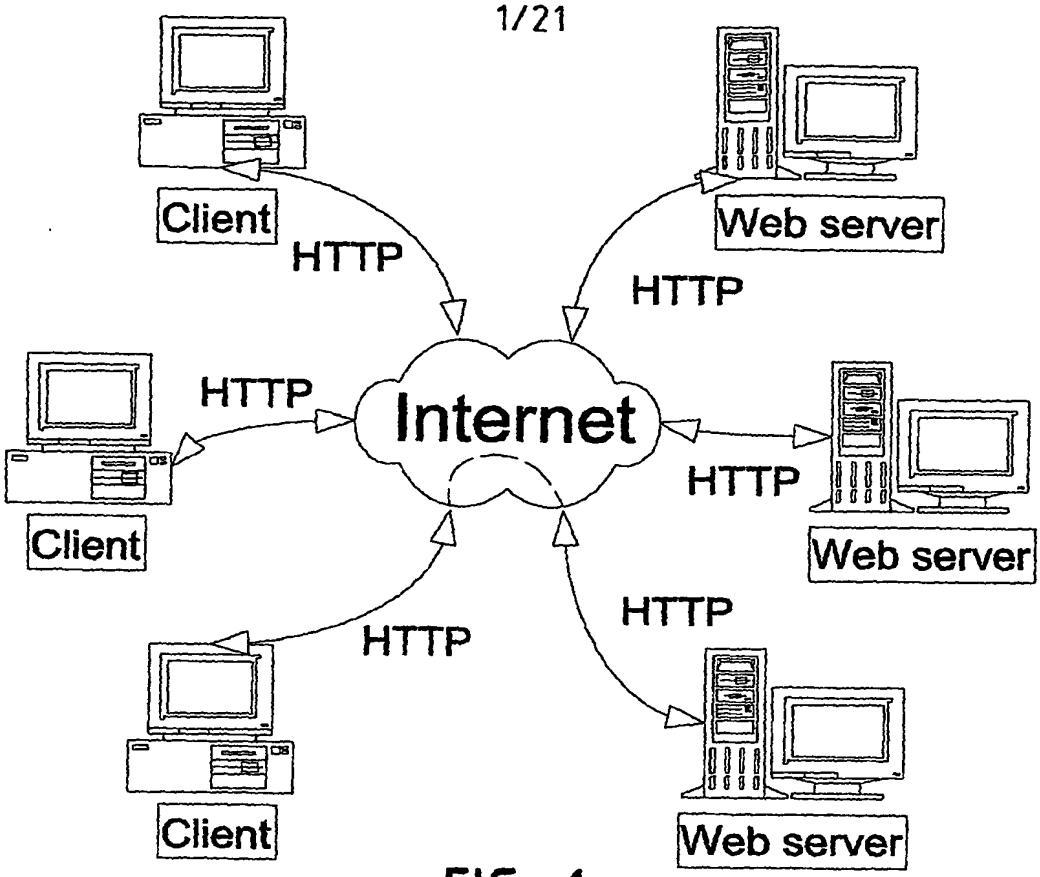

Client
HTTP
Web server
HTTP
HTTP
Internet
Client
HTTP
Web server
HTTP
HTTP
Client
Web server

FIG. 1

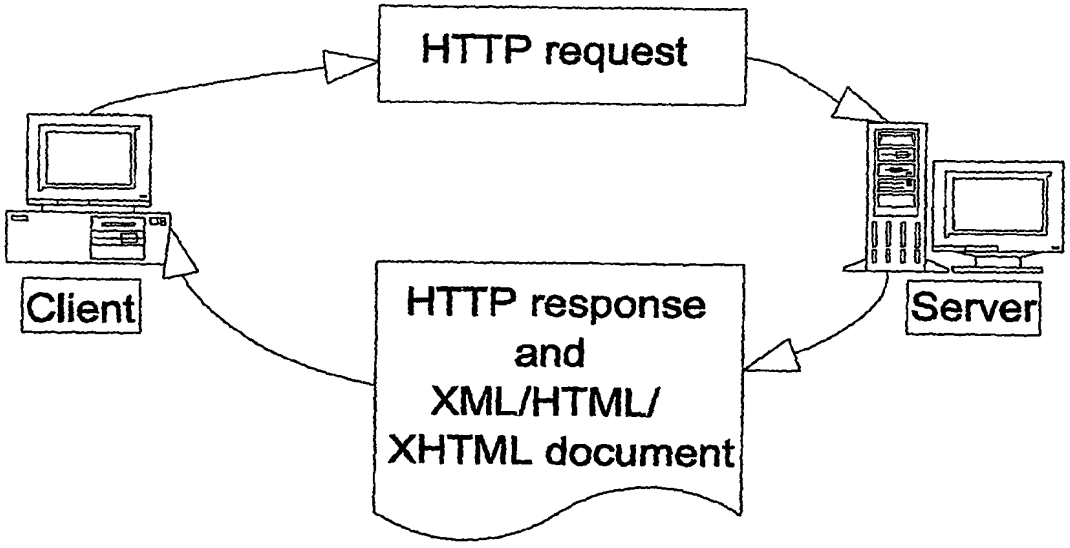

HTTP request
Client
Server
HTTP response
and
XML/HTML/
XHTML document

FIG. 2

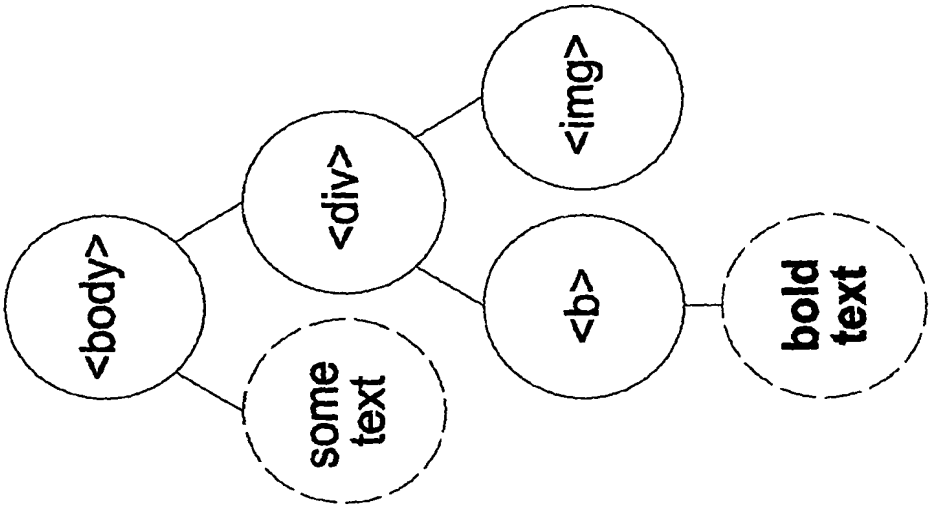
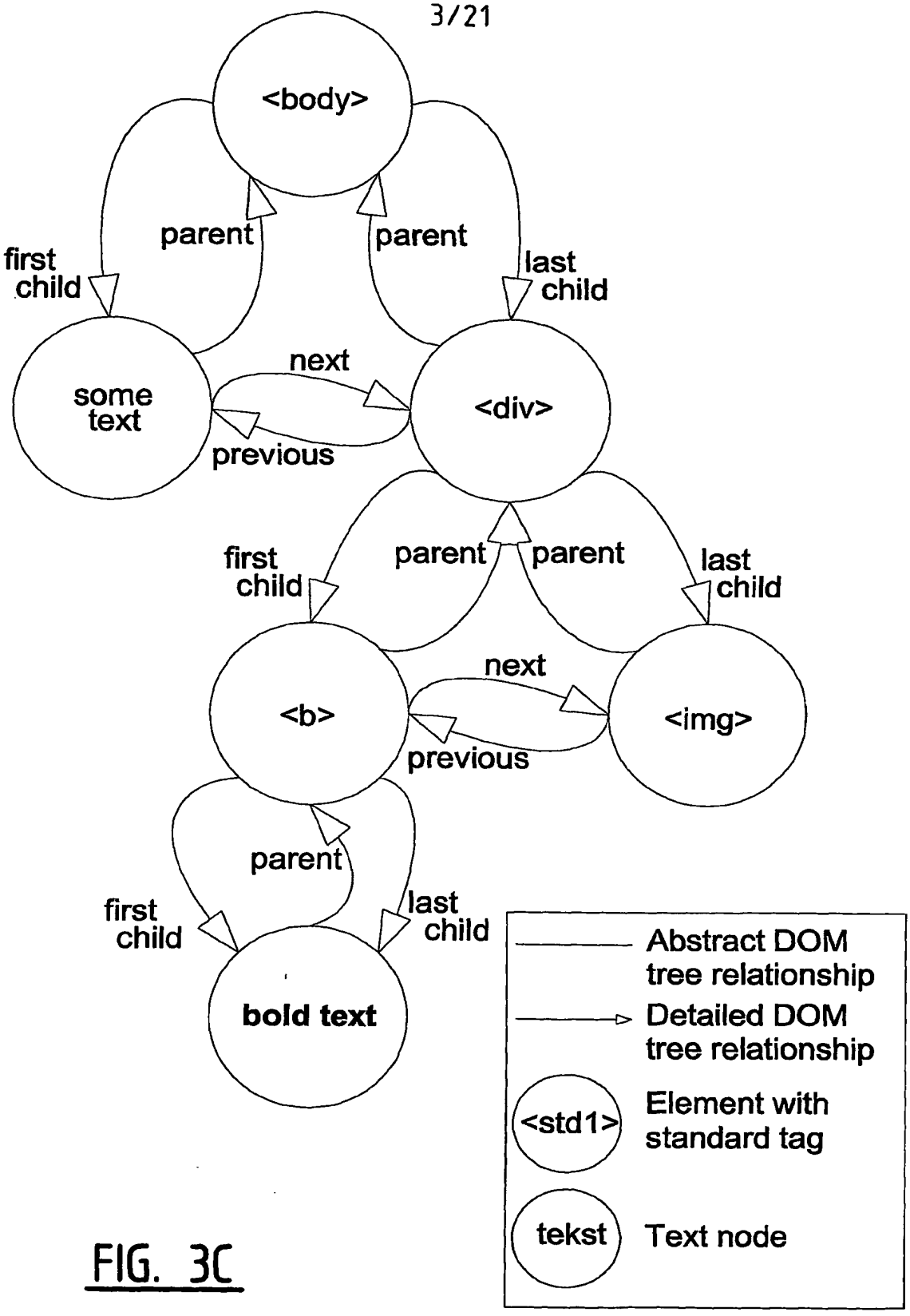


FIG. 3B

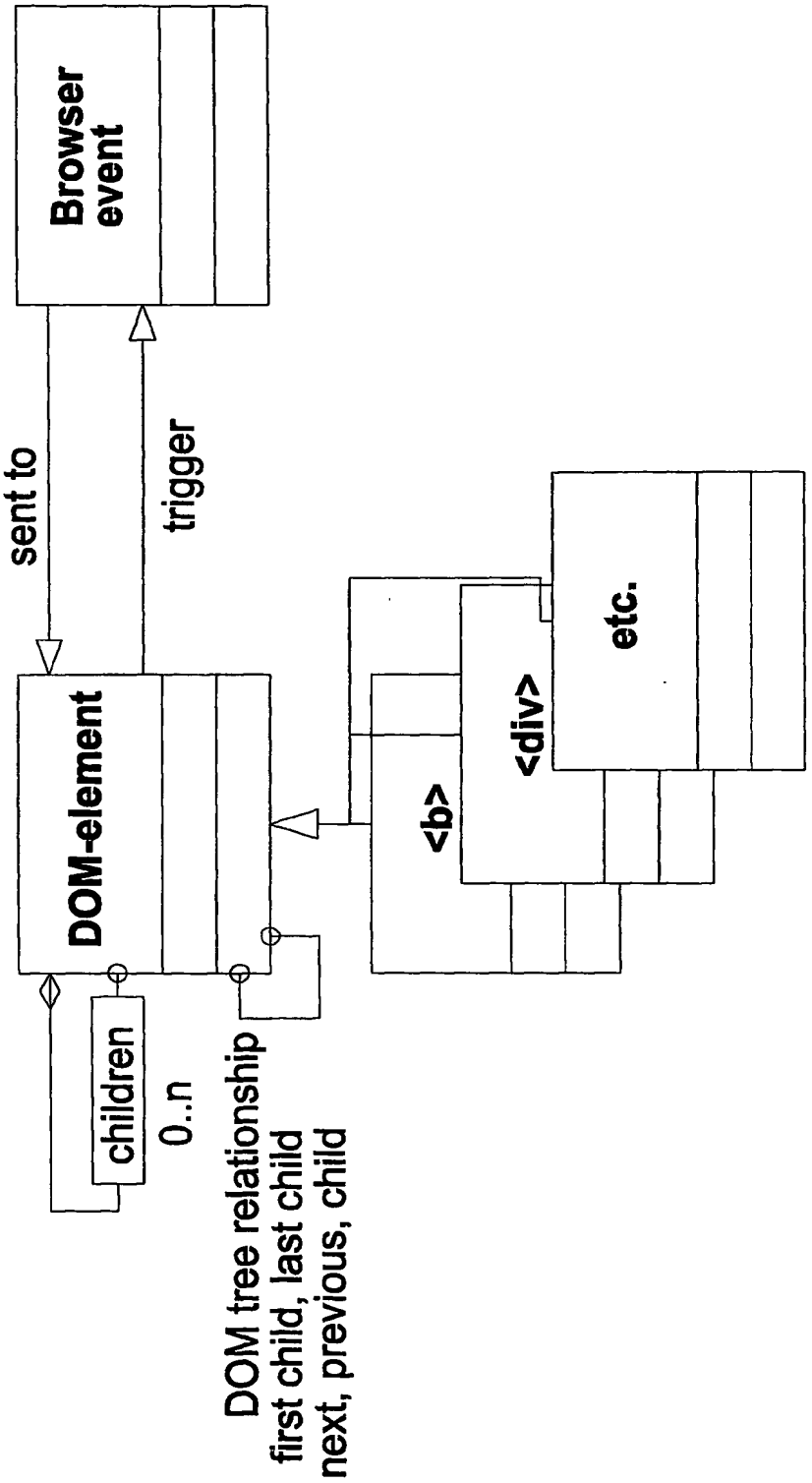
```
<body>
some text
<div>
<b>
bold text
</b>
<img src="img.gif" />
</div>
</body>
```

FIG. 3A


<body>
parent
parent
first child
last child
some text
next
previous

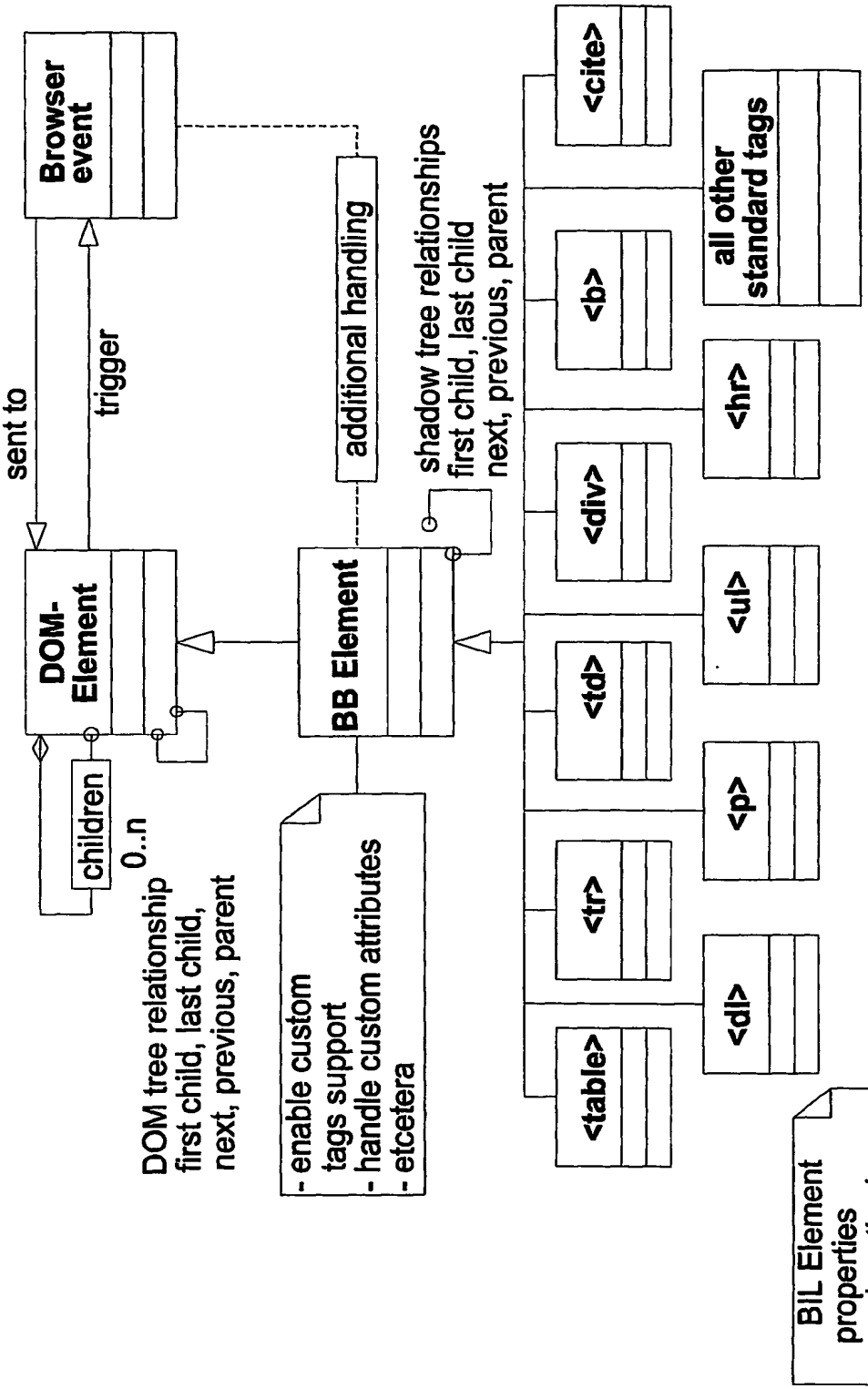
first child
parent
parent
last child
<b>
next
previous
<img>
parent
first child
last child
bold text
Abstract DOM tree relationship
Detailed DOM tree relationship
<std1>
Element with standard tag
tekst
Text node

FIG. 3C


Browser event
sent to
trigger
DOM-element
children
0..n
DOM tree relationship
first child, last child
next, previous, child
<b>

etc.

FIG. 4A


Browser event
sent to
trigger
additional handling
shadow tree relationships
first child, last child
next, previous, parent
DOM-Element
BB Element
children
0..n
DOM tree relationship
first child, last child,
next, previous, parent
- enable custom tags support
- handle custom attributes
- etcetera
<cite>
all other standard tags
<b>
<hr>

<td>
<p>
<tr>
<dl>
<table>
BIL Element properties and methods are 'inherited' by all existing HTML tags!

FIG. 4B

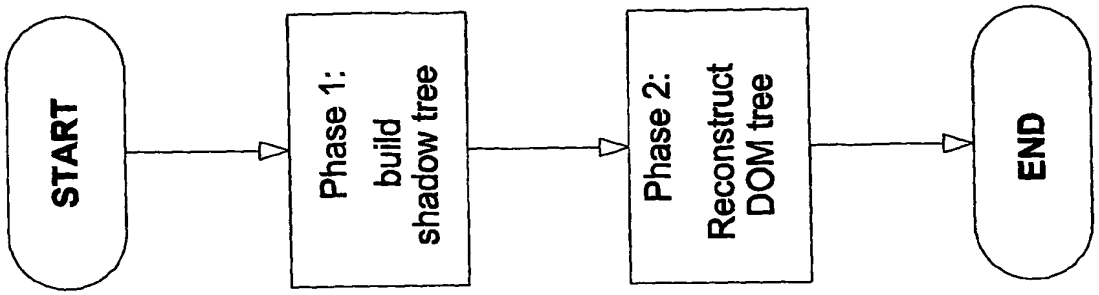

START
Phase 1: build shadow tree
Phase 2: Reconstruct DOM tree
END

FIG. 6

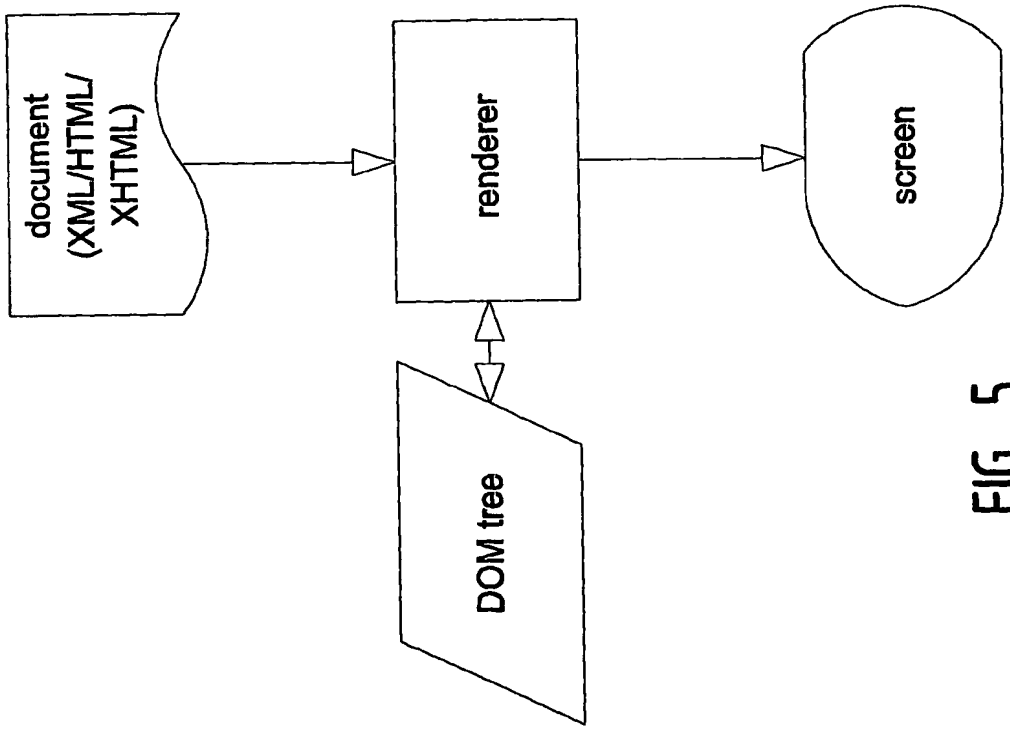

document (XML/HTML/ XHTML)
renderer
screen
DOM tree

FIG. 5

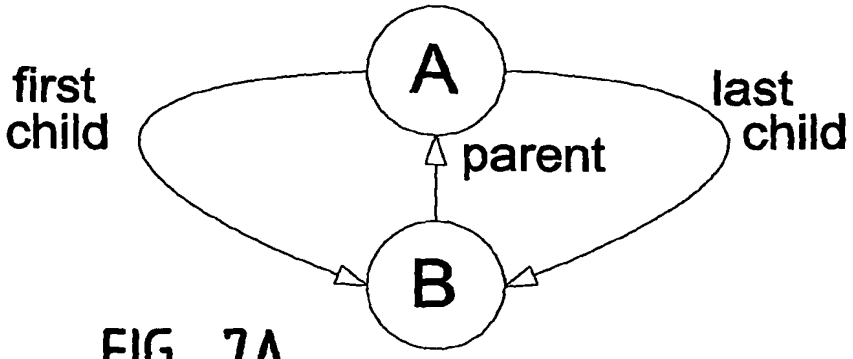


FIG. 7A

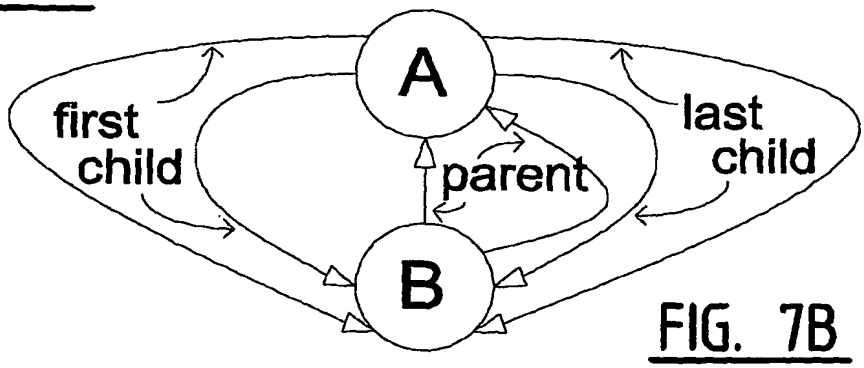


FIG. 7B

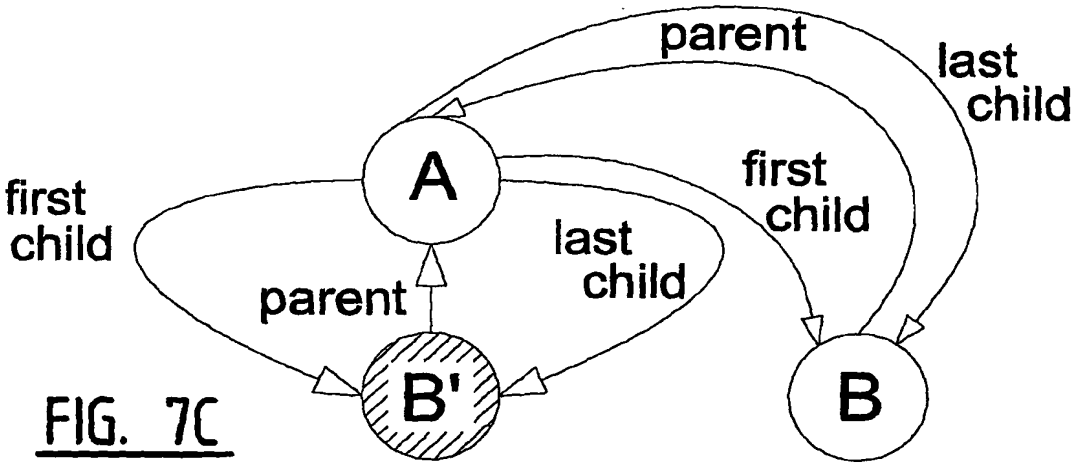


FIG. 7C

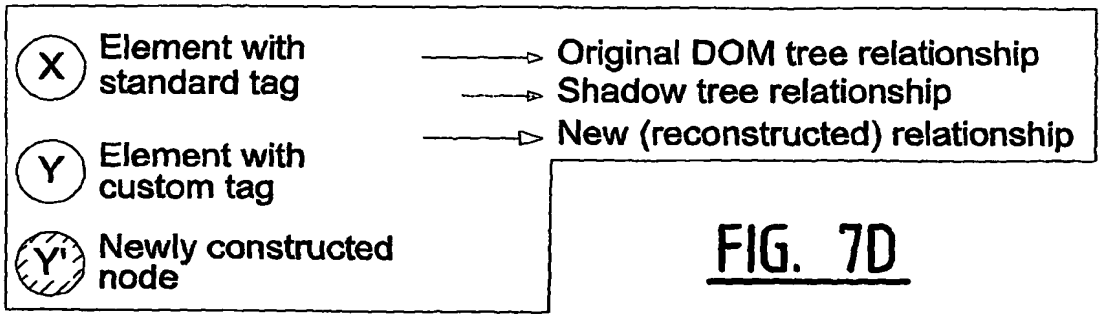


FIG. 7D

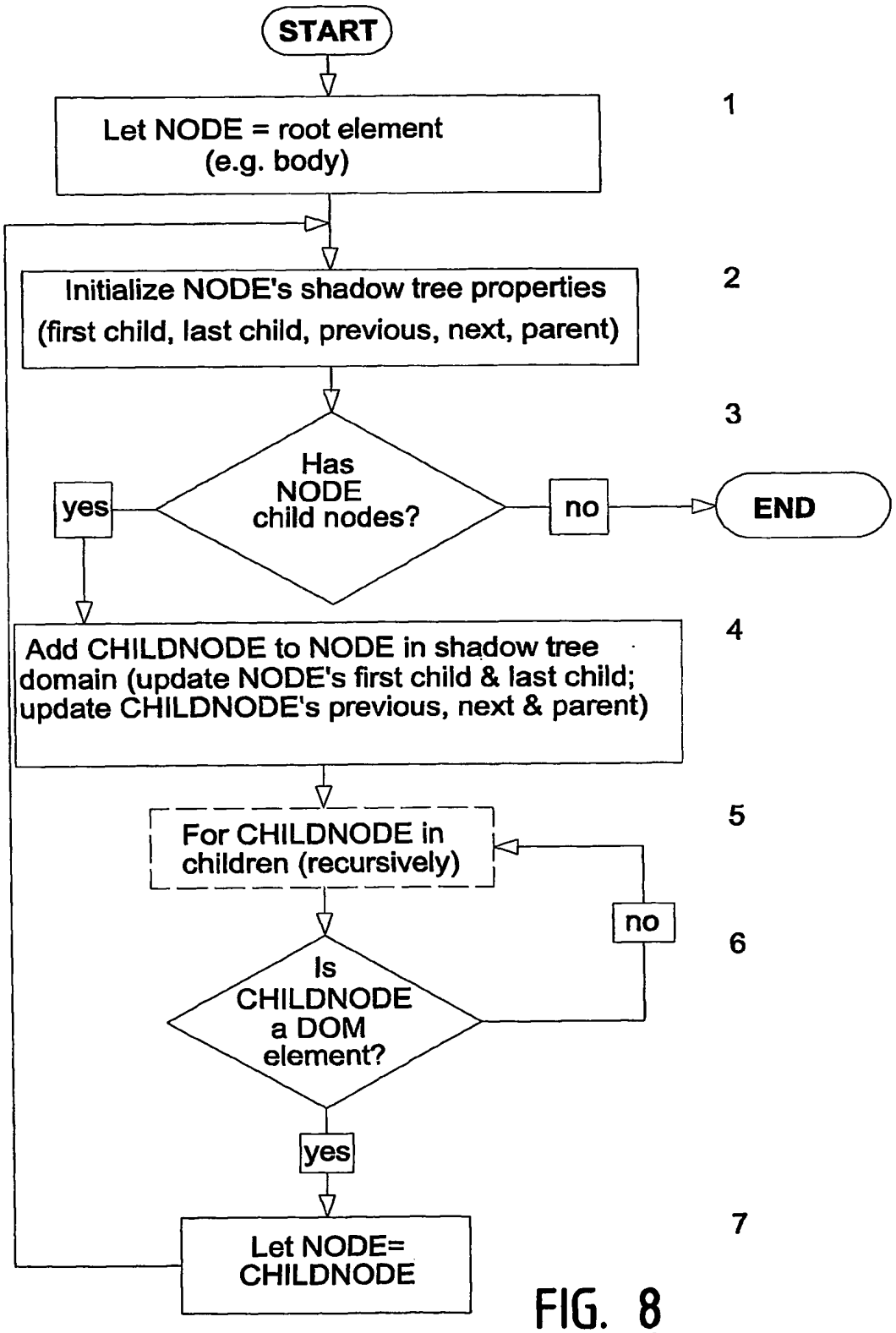

START
Let NODE = root element (e.g. body)
1
Initialize NODE's shadow tree properties (first child, last child, previous, next, parent)
2
Has NODE child nodes?
3
yes
no
END
Add CHILDNODE to NODE in shadow tree domain (update NODE's first child & last child; update CHILDNODE's previous, next & parent)
4
For CHILDNODE in children (recursively)
5
no
Is CHILDNODE a DOM element?
6
yes
Let NODE= CHILDNODE
7

FIG. 8

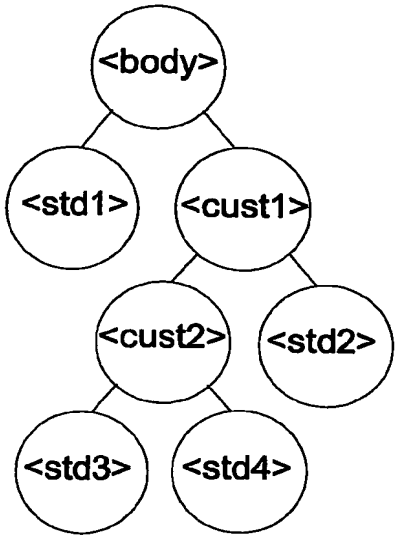


FIG. 9A

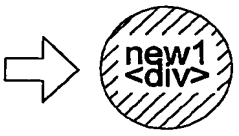


FIG. 9B

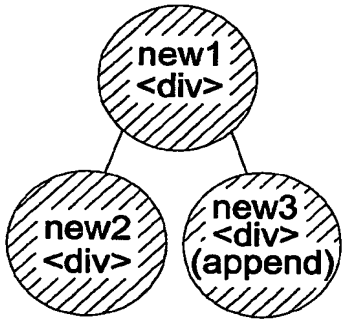


FIG. 9C

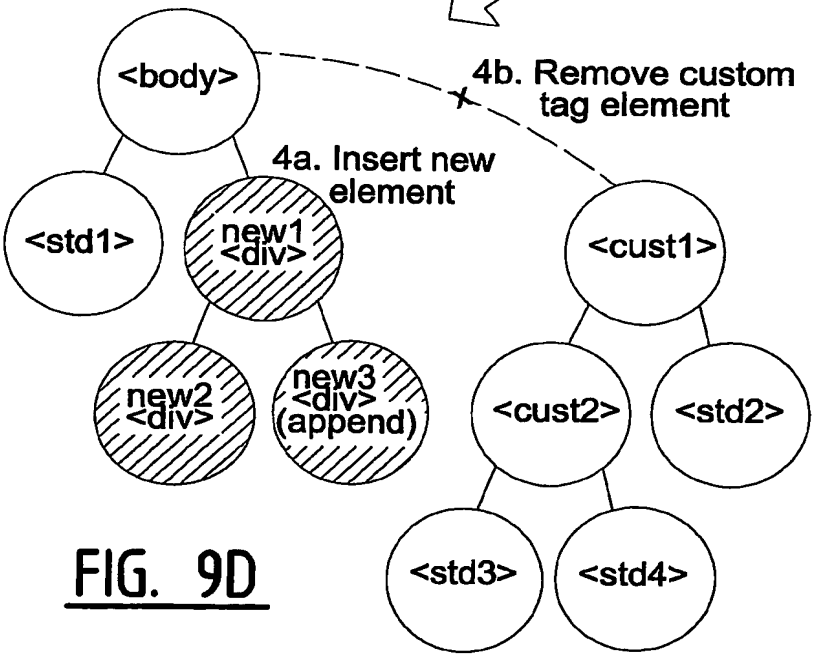
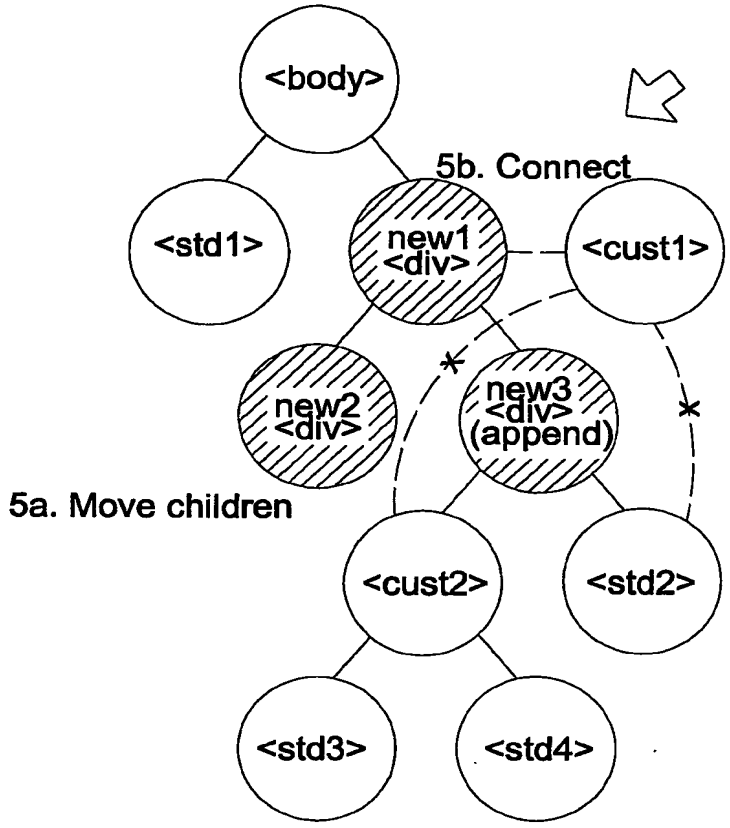


FIG. 9D


<body>
5b. Connect
<std1>
new1

<cust1>
new2

new3

(append)
5a. Move children
<cust2>
<std2>
<std3>
<std4>

FIG. 9E

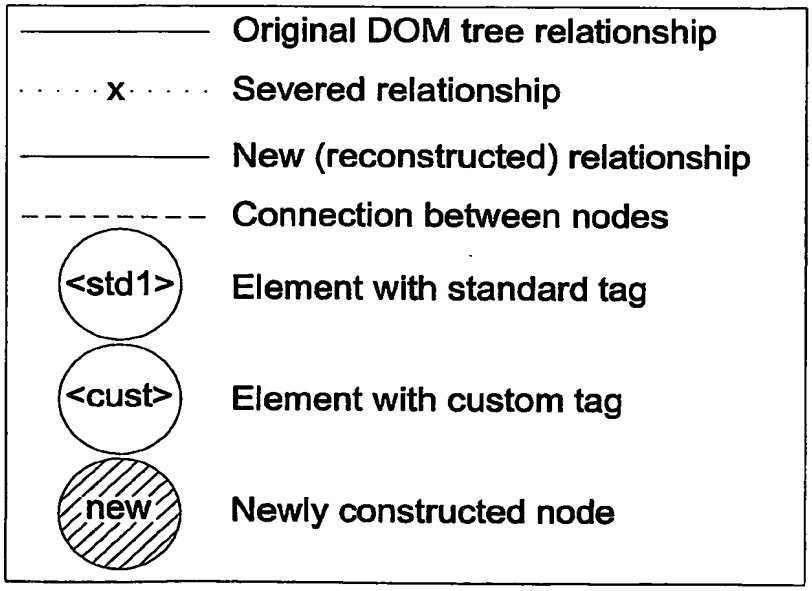

Original DOM tree relationship
x
Severed relationship
New (reconstructed) relationship
Connection between nodes
<std1>
Element with standard tag
<cust>
Element with custom tag
new
Newly constructed node

FIG. 9F

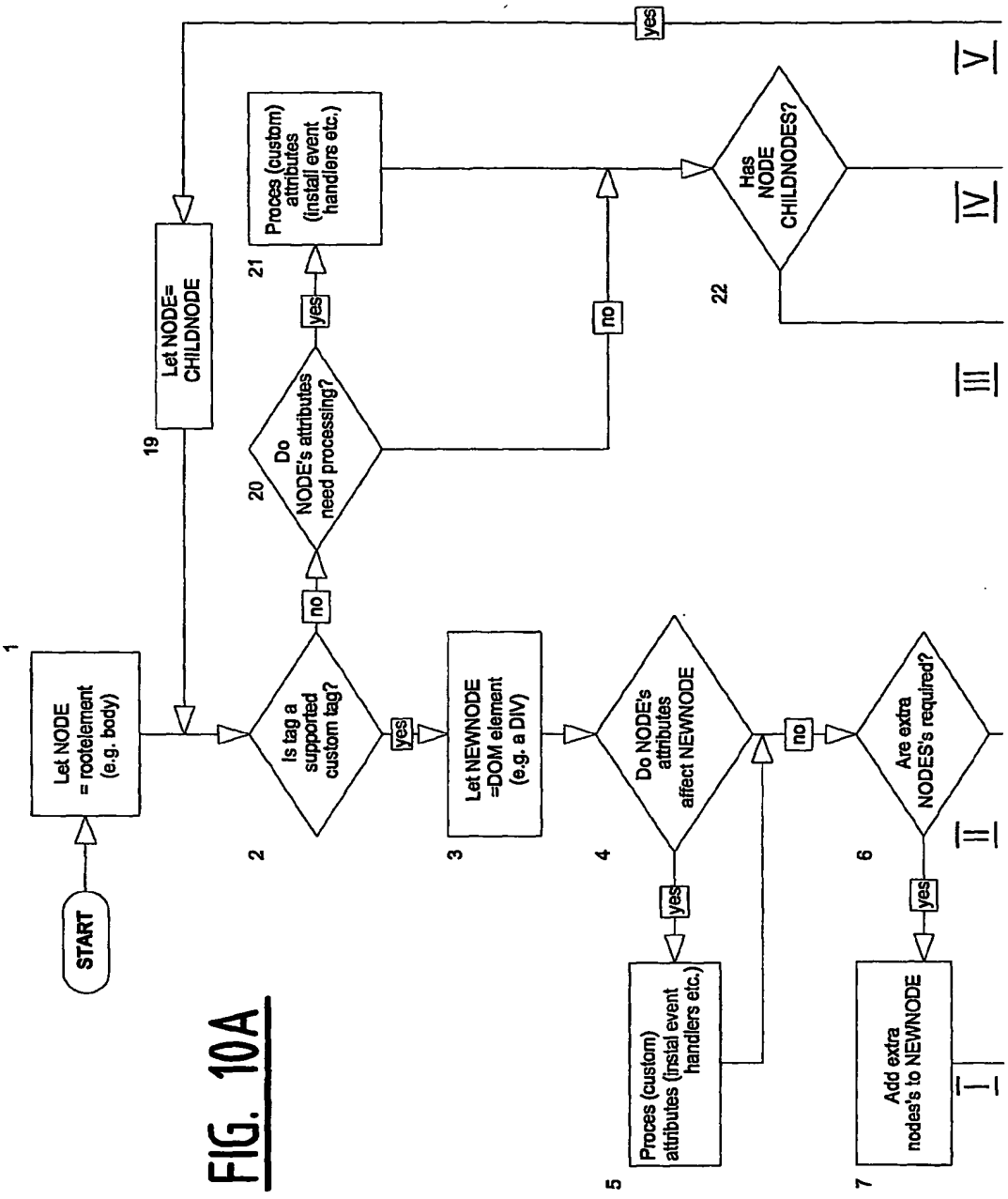

START
Let NODE = rootelement (e.g. body)
1
Is tag a supported custom tag?
2
yes
Let NEWNODE =DOM element (e.g. a DIV)
3
Do NODE's attributes affect NEWNODE
4
yes
Proces (custom) attributes (instal event handlers etc.)
5
no
Are extra NODES's required?
6
yes
Add extra nodes's to NEWNODE
7
I
no
Do NODE's attributes need processing?
20
yes
Proces (custom) attributes (instal event handlers etc.)
21
Has NODE CHILDNODES?
22
yes
V
IV
III
no
Let NODE= CHILDNODE
19
II

FIG. 10A

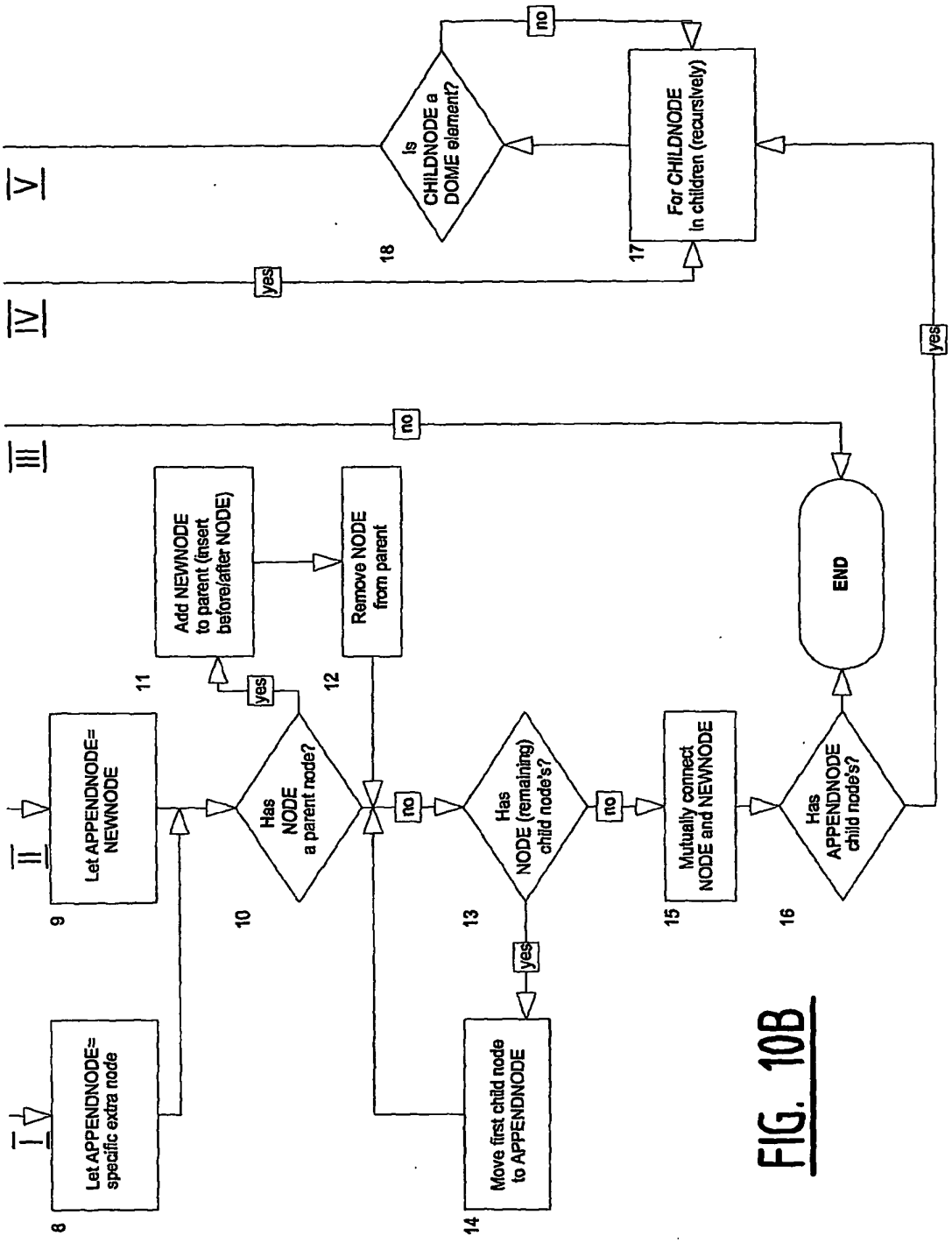

I
II
III
IV
V
Let APPENDNODE= specific extra node
8
Let APPENDNODE= NEWNODE
9
Has NODE a parent node?
10
yes
Add NEWNODE to parent (insert before/after NODE)
11
Remove NODE from parent
12
no
Has NODE (remaining) child node's?
13
yes
Move first child node to APPENDNODE
14
no
Mutually connect NODE and NEWNODE
15
Has APPENDNODE child node's?
16
yes
END
no
For CHILDNODE in children (recursively)
17
Is CHILDNODE a DOME element?
18
yes
no

FIG. 10B

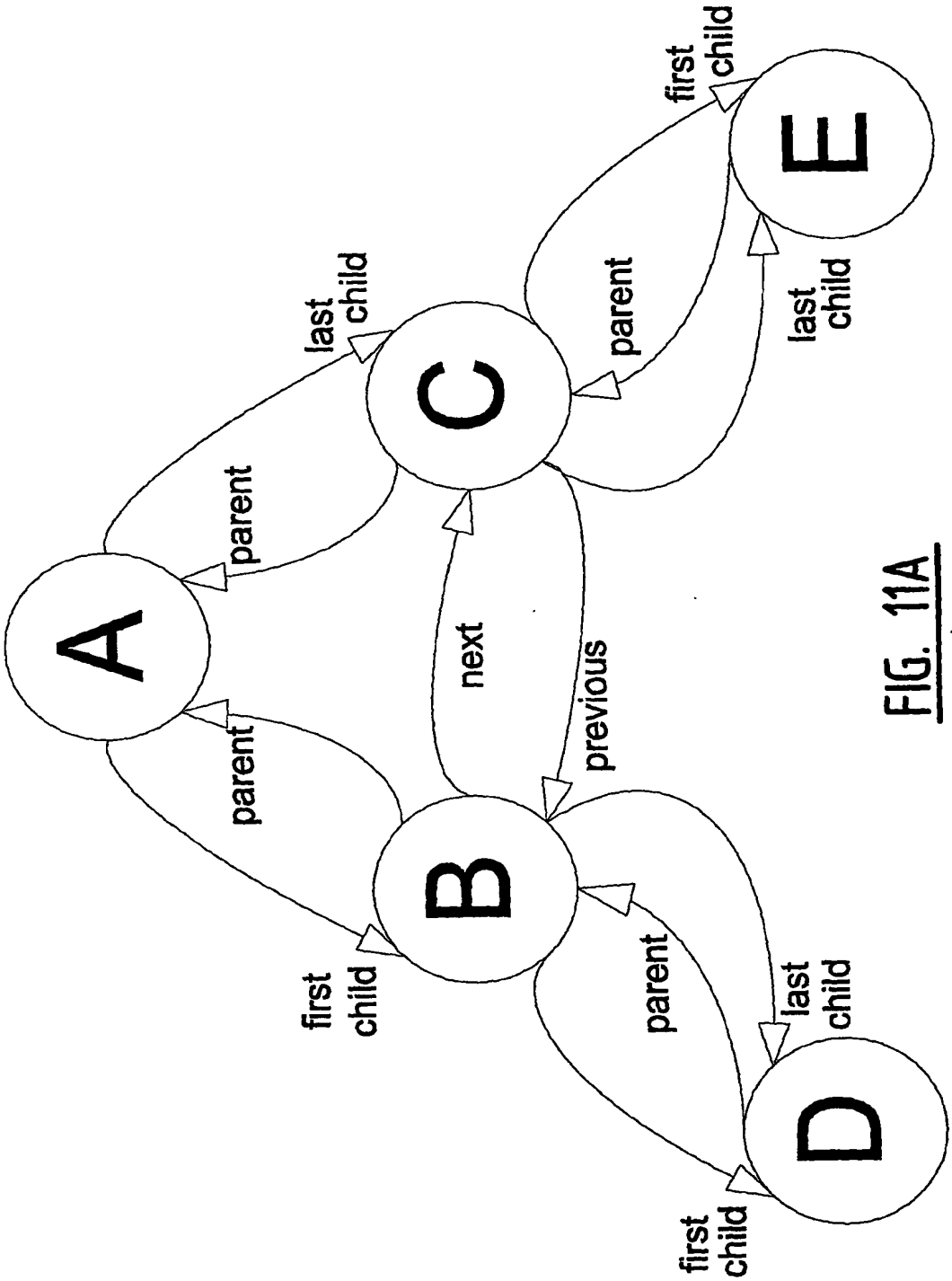

A
B
C
D
E
parent
parent
last child
first child
next
previous
parent
last child
first child
parent
last child
first child

FIG. 11A

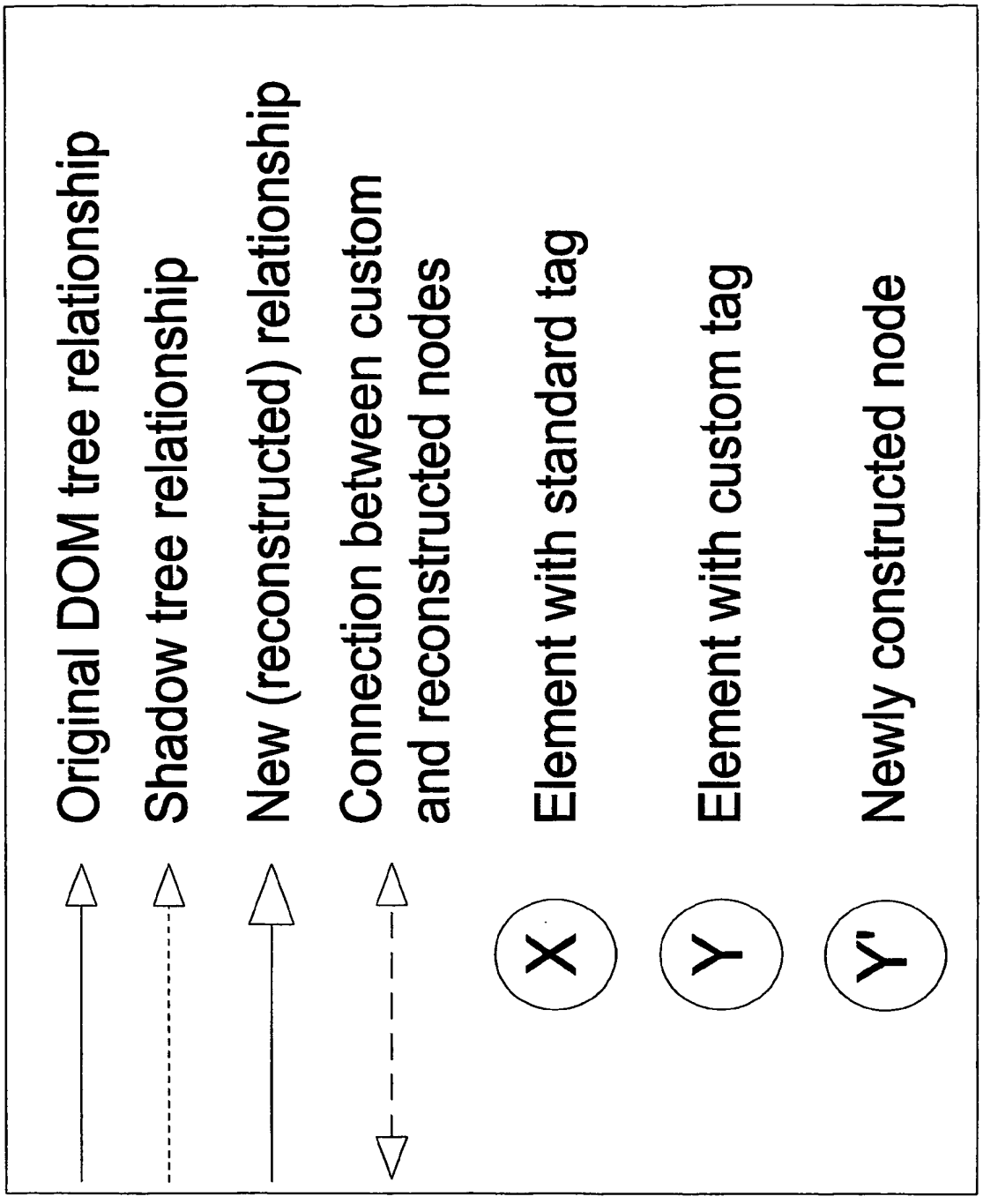

Original DOM tree relationship
Shadow tree relationship
New (reconstructed) relationship
Connection between custom and reconstructed nodes
Element with standard tag
Element with custom tag
Newly constructed node
X
Y
Y'

FIG. 11B

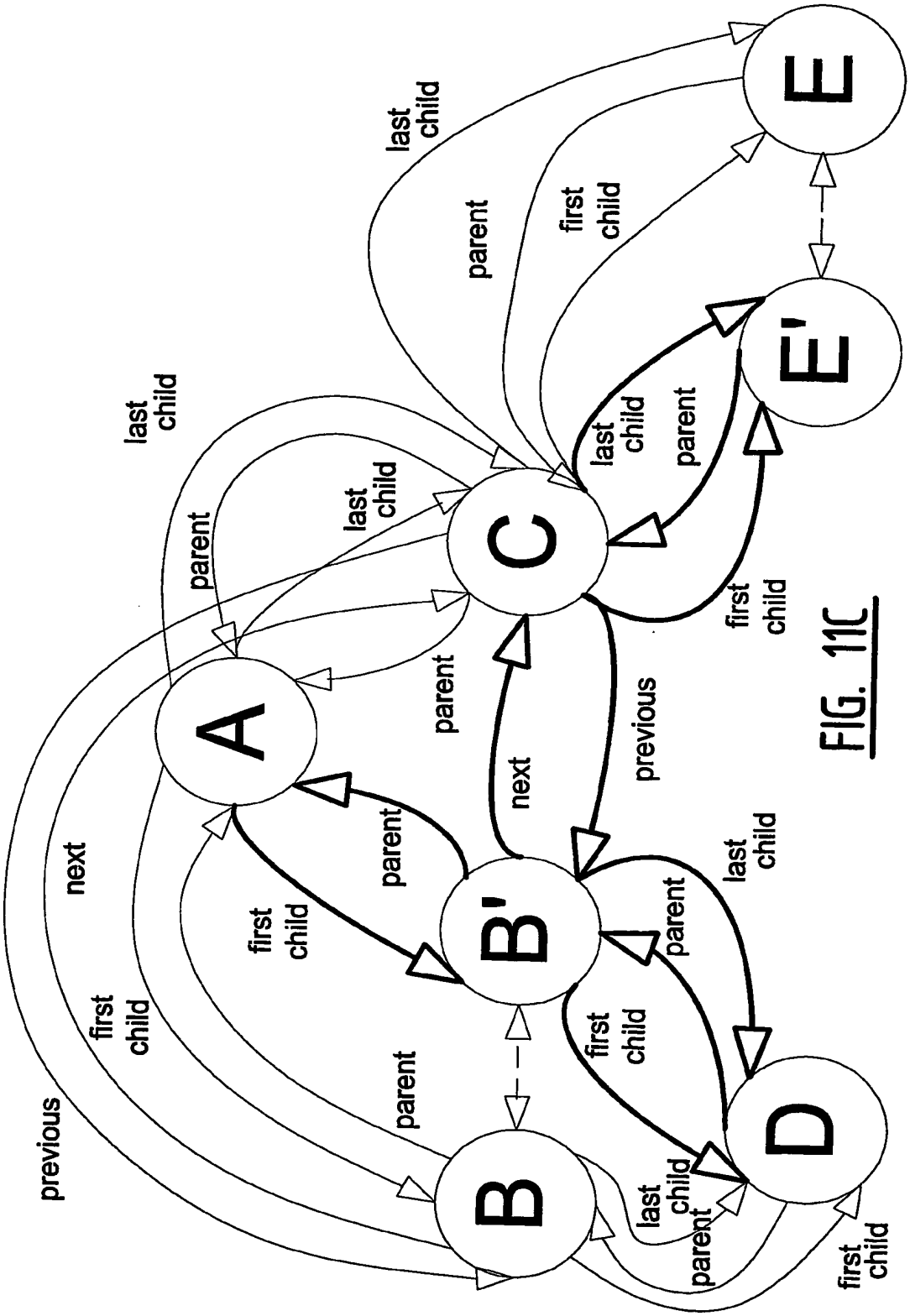


FIG. 11C

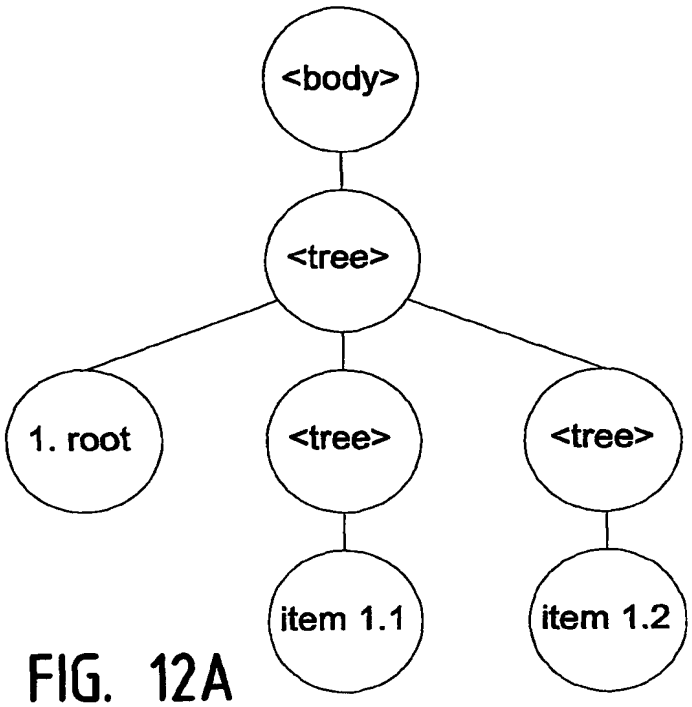


FIG. 12A

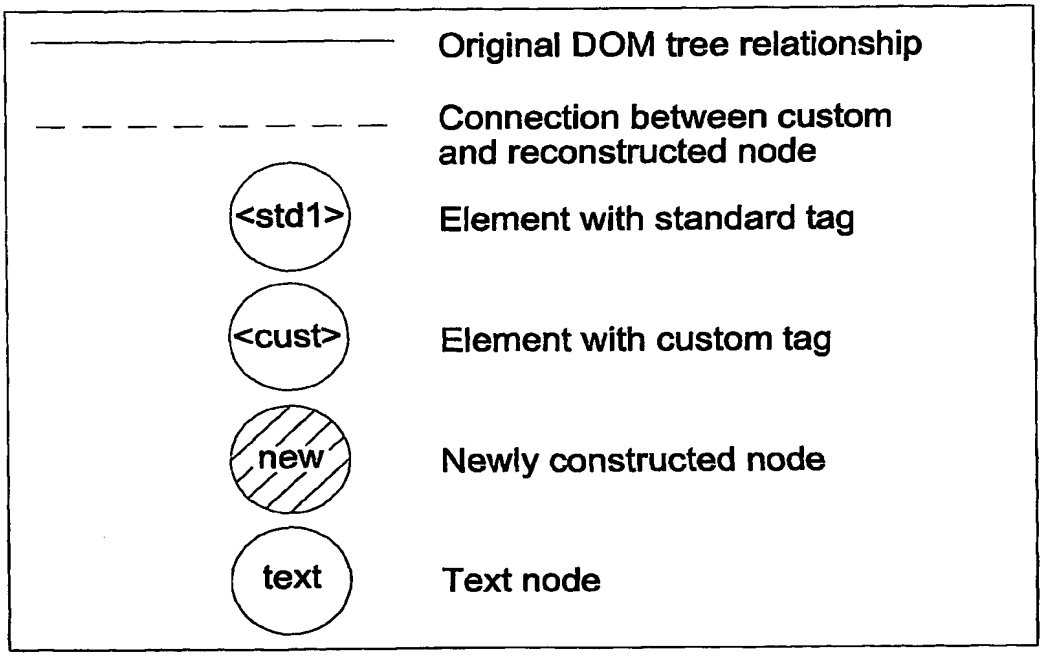
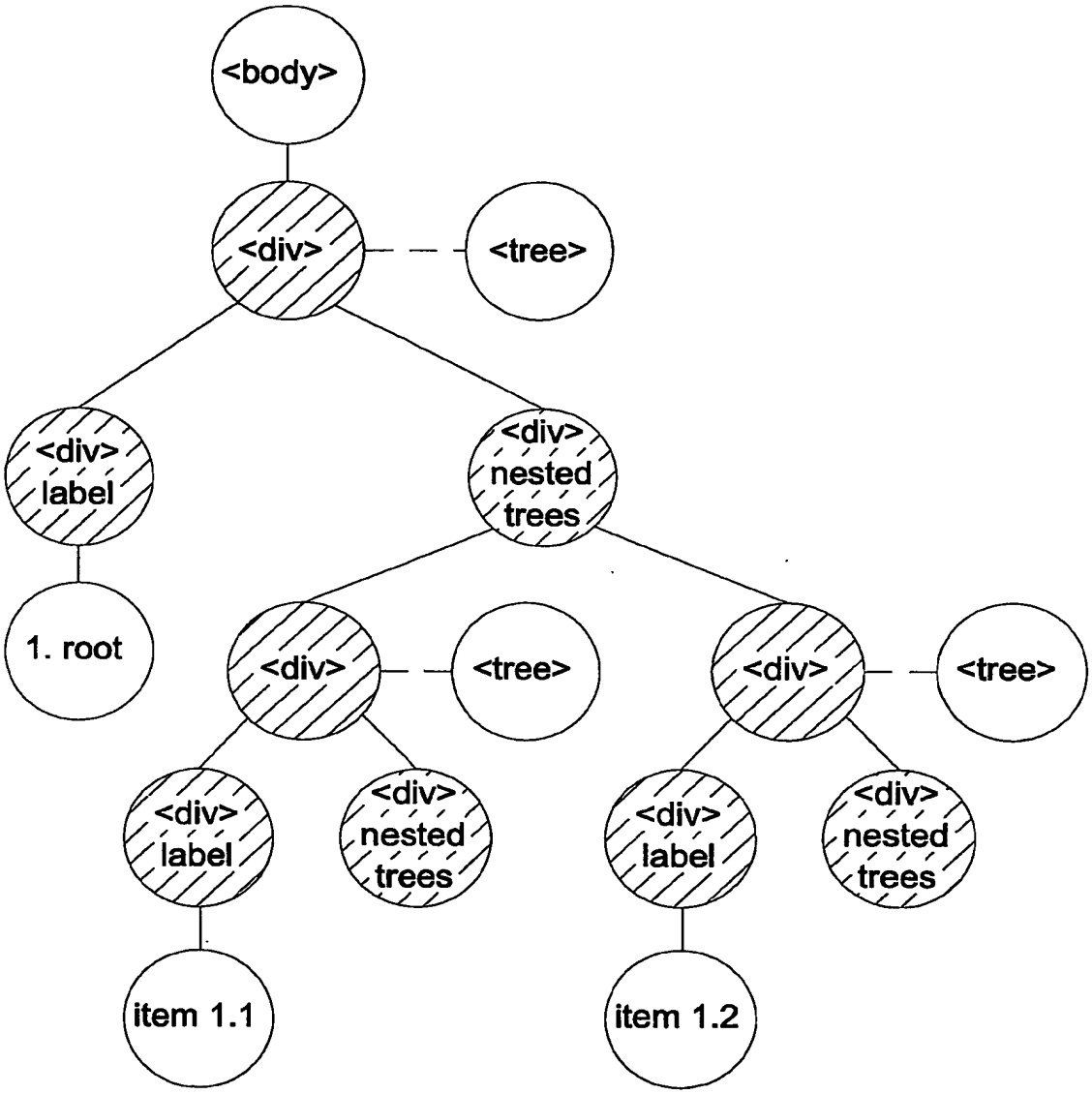


FIG. 12B


<body>

<tree>
 label
 nested trees
1. root

<tree>

<tree>
 label
 nested trees
 label
 nested trees
item 1.1
item 1.2

FIG. 12C

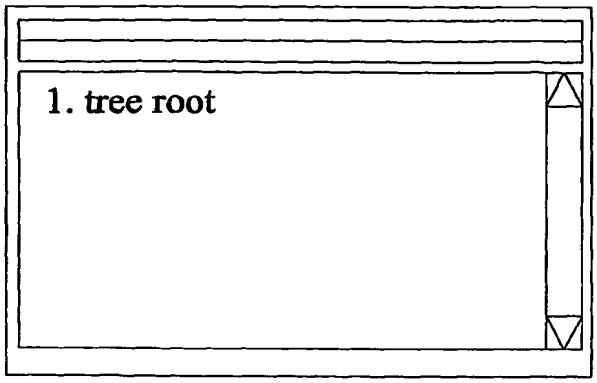


FIG. 13A

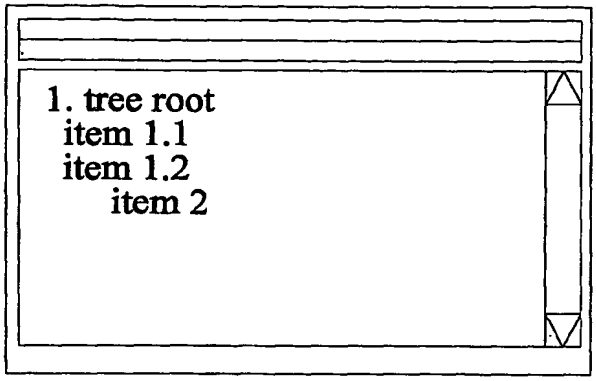


FIG. 13B

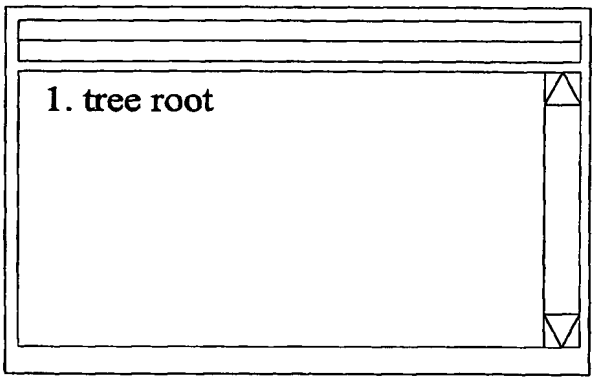


FIG. 13C

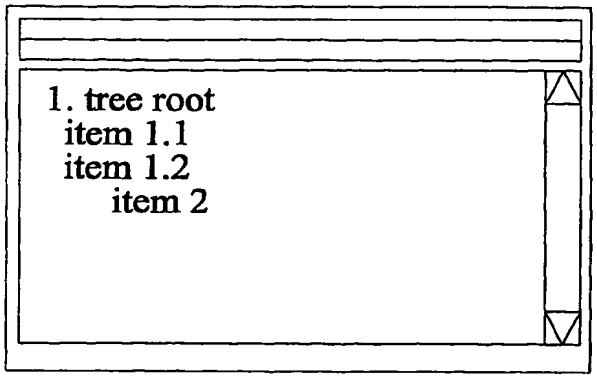


FIG. 13D

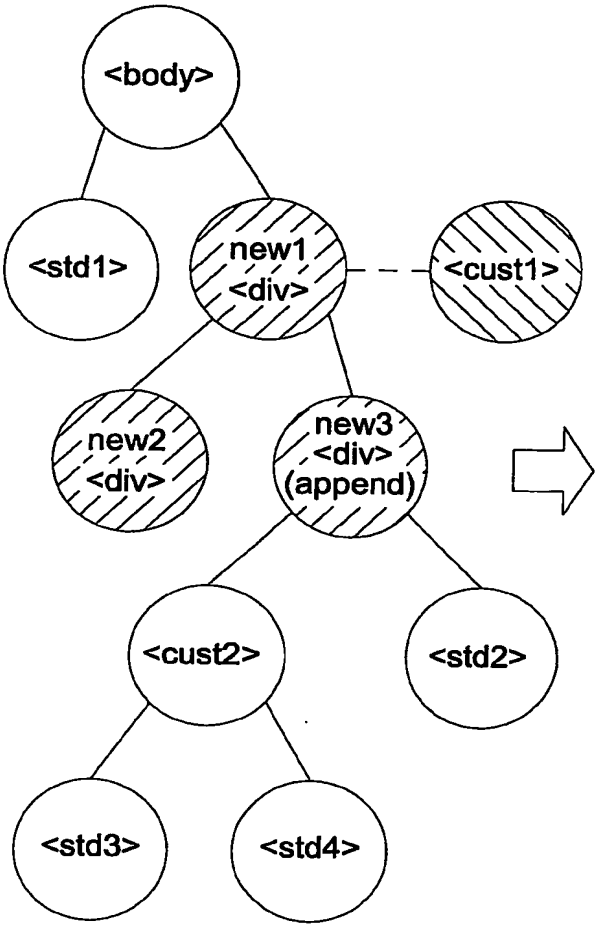


FIG. 14A

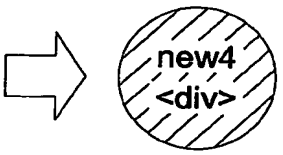


FIG. 14B

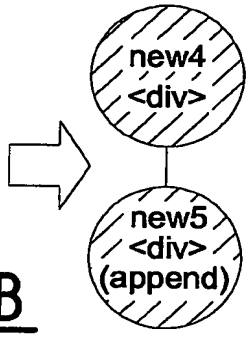


FIG. 14C

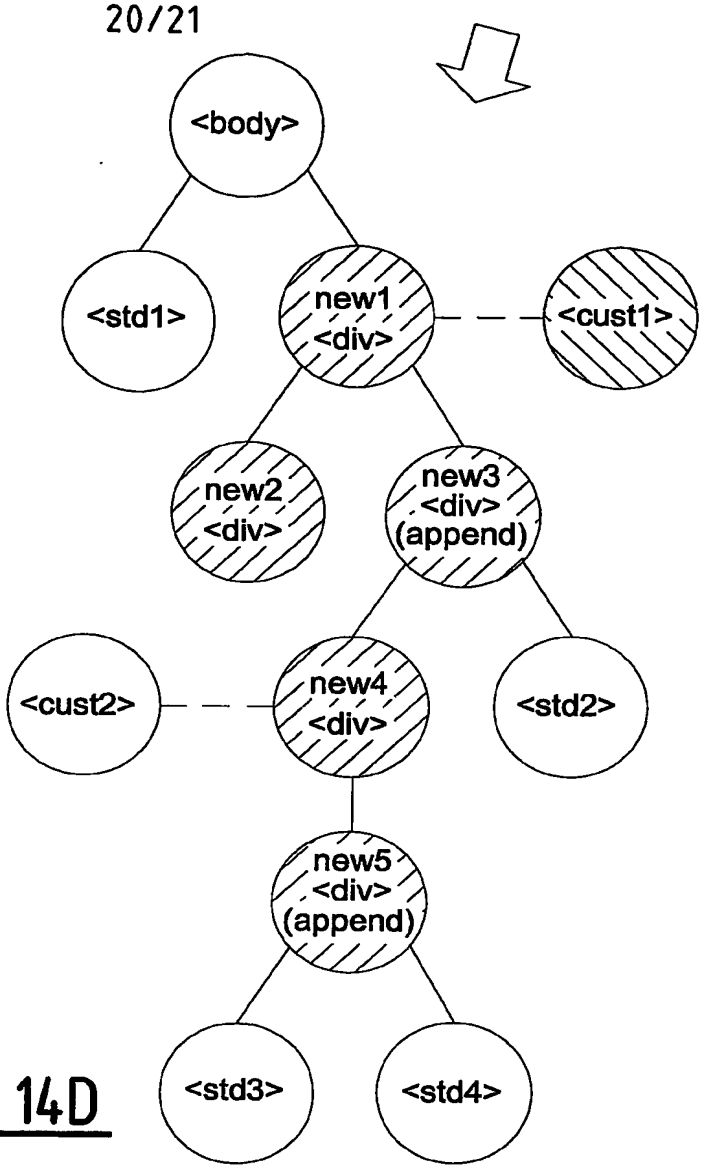


FIG. 14D

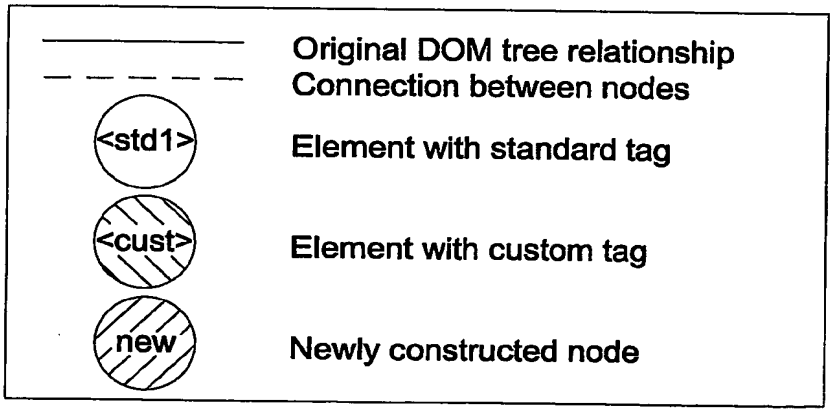


FIG. 14E

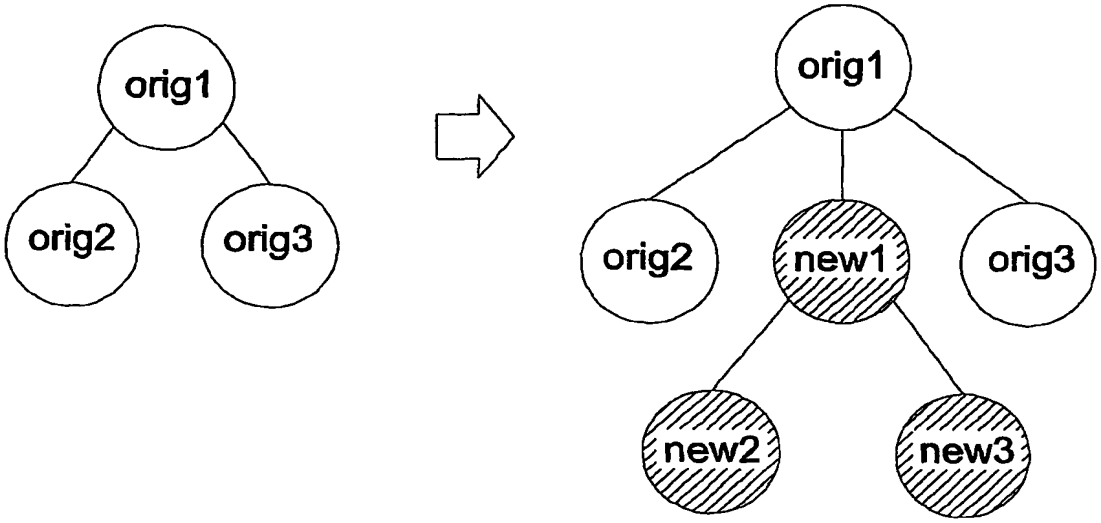


FIG. 15A

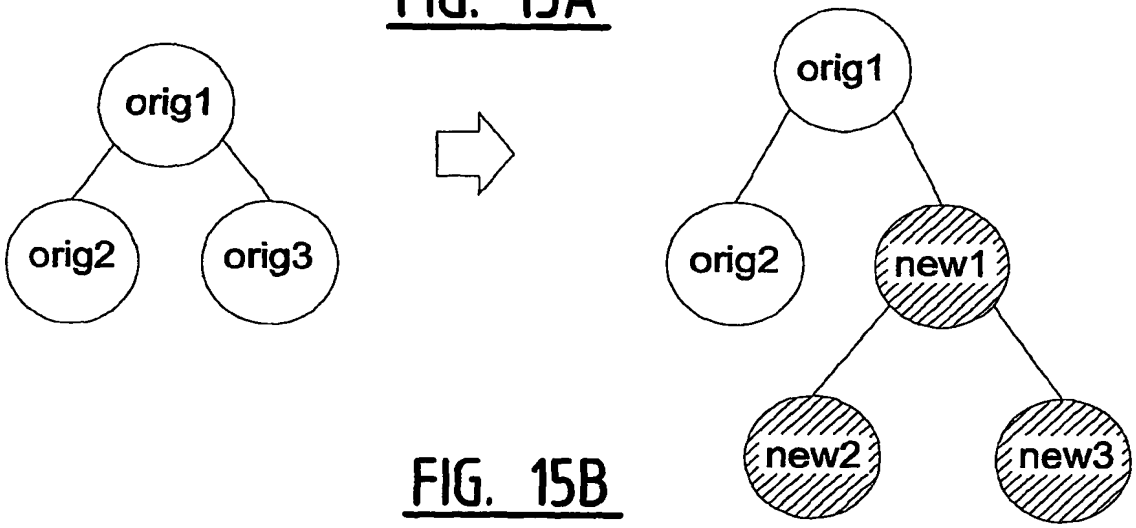


FIG. 15B

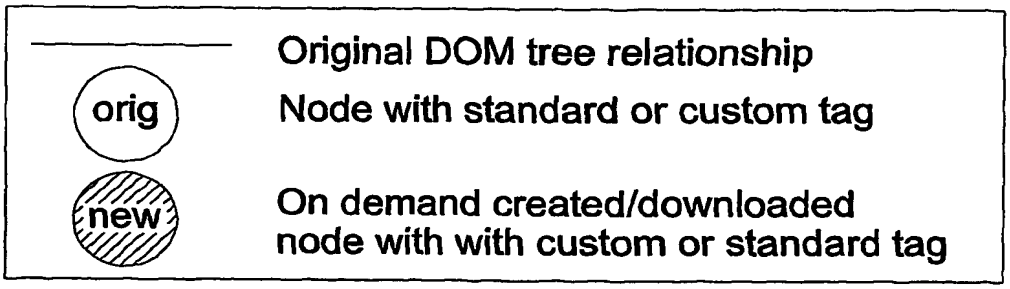


FIG. 15C